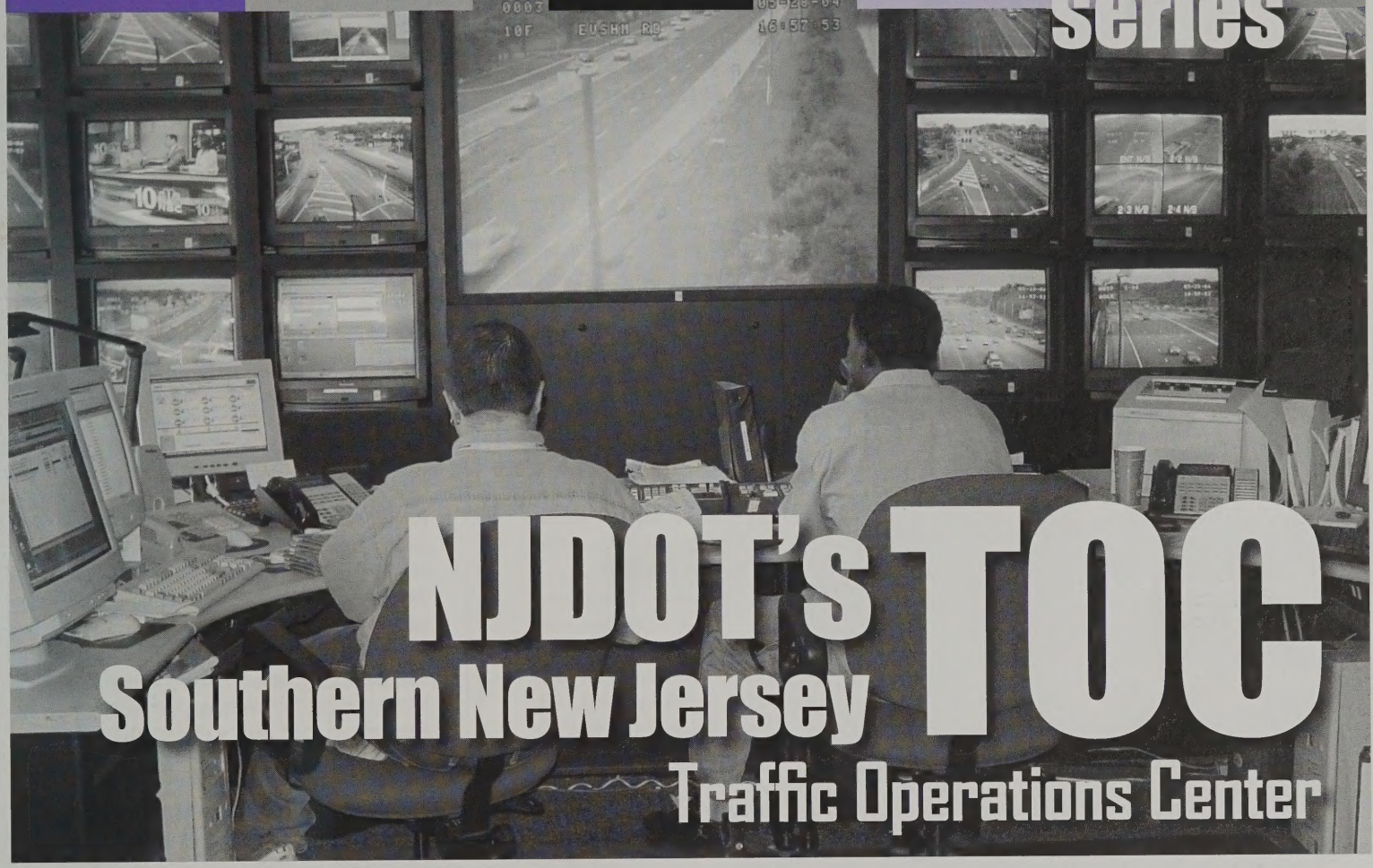
DISCOVERY series
Vol 1, Issue 2



NJDOT's Southern New Jersey TOC

Traffic Operations Center

Overturned tractor-trailers, car accidents, construction delays, vehicle breakdowns, traffic jams and more. Ever wonder how the State police and emergency response teams know about incidents on our State highways? Tucked away in an unassuming Cherry Hill office park resides the eyes and ears of southern New Jersey's State Highway response system. The high-tech Traffic Operations Center aims to help the motoring public travel as efficiently as possible, with a minimum of unnecessary delays.

The New Jersey Department of Transportation's Traffic Operations Center (TOC) acts as the nerve center of southern New Jersey's roadways—receiving traffic information, and deciding upon and implementing appropriate actions. The TOC is also responsible for reviewing, scheduling and approving all planned road closures in their region.

The backbone of the Traffic Operations Center operation is a combination of "eyes and ears" that feed information and images to the TOC. With this information, the TOC has the ability to react to incidents or problems in a variety of ways in order to aid motorists. The operation depends on diligent monitoring of congestion activity on the State's roadways, and on motivated, determined and skilled staff to react to emergencies and problems.

Receiving Information

Information flows into this impressive operation from many sources: through strategically placed TOC cameras, SmartRoutes Systems, Emergency Service Patrols, counties, municipalities and the New Jersey Communications Center.

The southern New Jersey region currently has approximately fifty cameras out on the roadways, controlled and moved by the TOC, and owned by NJDOT. In addition, SmartRoutes Systems—which provides real time traffic information in eighty-three U.S. cities for radio and television broadcast media—provides an additional five cameras in New Jersey and four in Philadelphia, which are viewed (but not controlled) by the TOC. These strategically placed cameras feed images to monitors in the TOC.

The TOC's nineteen monitors provide constant, rotating views of many state highways in southern New Jersey and the shore region. Some of the monitors are dedicated to specific roads, and scan through a number of cameras located along the roadway. For instance, the Route 29 tunnel has eight fixed-position cameras monitoring the flow of traffic. During times of peak congestion, one monitor will be dedicated to a "tour"

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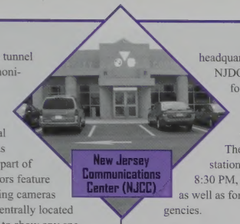

of the various cameras in this tunnel in a constant pattern. Some monitors are dedicated to specific highways suffering from continuous and heavy congestion, with additional monitors scanning various roadways in a particular part of the State. Several monitors feature a variety of ever-changing cameras and roads. The large centrally located monitor can be used to show any specific roadway or to zoom in on specific roadway situations.

SmartRoutes, which shares a strong partnership with NJDOT's TOC operation, staffs a computer monitoring station in the TOC, providing input from SmartRoutes' reporters, their own traffic cameras, planes, and various on-road individuals who serve as information "probes". At the same time, information from the TOC is relayed to SmartRoutes from within the Center via verbal communication, incidents observed on the numerous TOC monitors, and the use of scanners. Once there is new information, the SmartRoutes computer operator provides this news to their headquarters for media broadcast, NJDOT website updates, and for a real-time traffic map that they maintain on behalf of NJDOT at www.njcommuter.com. The SmartRoutes computer station is staffed from 4 AM to 8:30 PM, Monday through Friday, as well as for special events and emergencies.

More information comes into the TOC from the numerous Emergency Services Patrol (ESP) staff who ride the roads assisting stranded motorists, reacting to breakdowns or accidents, and removing obstructions from the roadways to keep traffic moving (see CCCTMA's *Discovery Series*, Volume 1, Issue 1). NJDOT's Jim Hogan states: "The ESP personnel serve as our eyes and ears on roadways not currently covered by cameras."

A major source of input to the TOC is the New Jersey Communications Center (NJCC), located in Hamilton, NJ (Mercer County). Located at the intersection of Routes 195 and 130, the NJCC is a combination of dispatch services of the NJ State Police, Department of Transportation (NJDOT) and Department of Environmental Protection (NJDEP) which all operate communications services from the center. This helps to coordinate the three agencies' services, especially under emergency conditions. In fact, the Center will soon also add staff from the State Marine Police.

The NJCC receives calls from municipalities, counties, EMS units, emergency services and other State agencies. Since it is a combined center with NJDOT, State Police and NJDEP, the calls into the Center range from emergencies to non-emergencies. The calls may include traffic incidents, hazardous spills, bear sightings, A.M.B.E.R. Alerts, reports of unruly campers, and calls about signs, maintenance, traffic signals and potholes. Once a traffic-related call is received, the Center conveys the information to the TOC and dispatches maintenance or emergency crews, or during certain hours, Emergency Service Patrol personnel. The NJCC also includes a Command Center which is only utilized during emergency situations.

All these information sources are further supported by contacts from the various county emergency services, which freely call or radio the TOC.

Responding to Information

The TOC's responses to traffic incidents and congestion result in a series of well organized actions geared to quickly improve the traffic flow on behalf of the motorist. For example, if the TOC receives a report about an incident that causes the shutdown of a roadway at rush hour, and the shutdown is at a location not covered by cameras, the TOC would dispatch ESP personnel (ESP is dispatched from the TOC from 10 AM to 6 PM, Monday through Friday, and all other hours from the NJCC) to secure the site and radio information to the TOC about the extent of the incident. If necessary, based on the analysis of ESP personnel at the scene, the TOC could call in the State Police and/or NJDOT's Incident Management Response Team (IMRT), or request that NJSP dispatch a super wrecker to remove an overturned tractor trailer. They might also require the transport of portable variable message signs (VMS) to be placed in strategic locations, or send notices to a permanent VMS, in order to warn approaching motorists. Once in place, many of the portable VMS units can be controlled remotely and programmed from the TOC to display messages of importance.

The TOC makes a determination of the extent of the incident and the anticipated duration before the scene is normalized. Emails and faxes are sent out to a mailing list in order to communicate the incident. *(Note: Cross County Connection TMA is on their list and retransmits the information to its region-wide contacts on behalf of NJDOT.)*

TOC personnel can direct cameras to provide a better look at an area suffering from visible but unexplained congestion or back-ups.

Jose Garcia, NJCC

The smoother video images on the TOC's monitors are courtesy of fiber optic cable, while the choppier images are the result of older, existing T1 lines.

New Jersey Communications Center (NJCC)
Any traffic related calls received from municipalities, counties, EMS units, emergency services or other State agencies are relayed to the TOC.

SmartRoutes
Sends input from reporters, traffic cameras, planes and individuals who serve as on-road information probes

Traffic cameras
TOC accesses real time traffic info from 55 cameras in New Jersey.

Emergency Service Patrol (ESP)
"ESP Personnel serve as our eyes and ears on roadways not currently covered by cameras." —Jim Hogan, NJDOT

County emergency services
Contacts from various counties freely call or radio the TOC.

NEW JERSEY TRAFFIC OPERATIONS CENTER (TOC)

Emergency Service Patrol personnel
May be dispatchec to secure the site and radio the TOC.

Variable Message Signs (VMS)
TOC may have to transport portable variable message signs or send notices to a permanent one.

Traffic Alerts
NJDOT transmits emails and faxes to their mailing list notifying public of the extent and duration of the incident.

Contact State Police
and/or call NJDOT's Incident Management Emergency Response Team (IMRT) or dispatch a superwrecker to remove an overturned tractor trailer.

The south Jersey region has **50** cameras which are controllable and moveable from the TOC, and owned by NJDOT. SmartRoutes provides an additional **5** cameras in New Jersey which can be viewed by the TOC. **Nineteen** monitors at the TOC provide constant and rotating views of many state highways in southern New Jersey and the shore region.

A Little Southern NJ TOC History

We've come a long way, baby! The southern NJ TOC began operations in 1996 at its previous southern headquarters at the intersection of Fellowship Road and Church Road in Mount Laurel. Prior to July of 2001, the TOC was staffed during limited hours and located in a converted 150 square foot closet. In the original TOC, 4 monitors were dispersed around this long and narrow room, as were 3 computer monitoring stations. Fans located at the doorway of the room attempted to cool the room and the staff inside.

Fast Forwarding to 2004

A new, 1350 square foot state-of-the-art TOC facility features:

- 10 workstations
- 18 large wall-mounted monitors
- 1 very large 87" wall-mounted monitor
- Security
- Dedicated cooling system
- Battery back-up
- Room for expansion

The 19 monitors can be programmed to show any televised roadway or camera, or any series of cameras or roadways, that NJDOT deems necessary. The TOC is now also staffed 24 hours a day, 7 days a week.

What Goes On at the TOC?

My assignment—observe New Jersey Department of Transportation's high-tech Traffic Operations Center-South located in the southern New Jersey operations building in Cherry Hill's Executive Campus Office Park. Security was tight in getting to the floor where the TOC is located, with even more security to enter the TOC itself.

Once inside, my eyes immediately traveled to the wall of monitors displaying live images of traffic activity transmitted by cameras watching for traffic disruptions throughout southern New Jersey. These transmitted images are where the action begins, but not where all the action resides. The action is what happens as these images and reports from a variety of sources—radioed, phoned and emailed—pour into the TOC.

I am greeted by Jim Hogan, Director of Traffic Operations. Jim is responsible for the overall operation of the TOC, while day-to-day management duties fall to Rich Eng (acting Manager, Traffic Operations South). Mark Smith is the southern TOC Supervisor. Jim explains that the TOC depends on a diligent and skilled staff to monitor traffic activity on the State's roadways and to react promptly to emergencies and problems.

Clearly, not all State highways in this vast region are covered by the existing cameras

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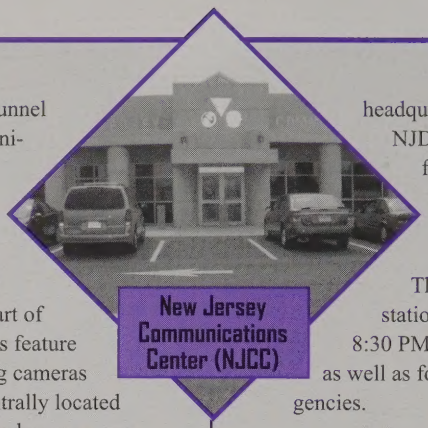

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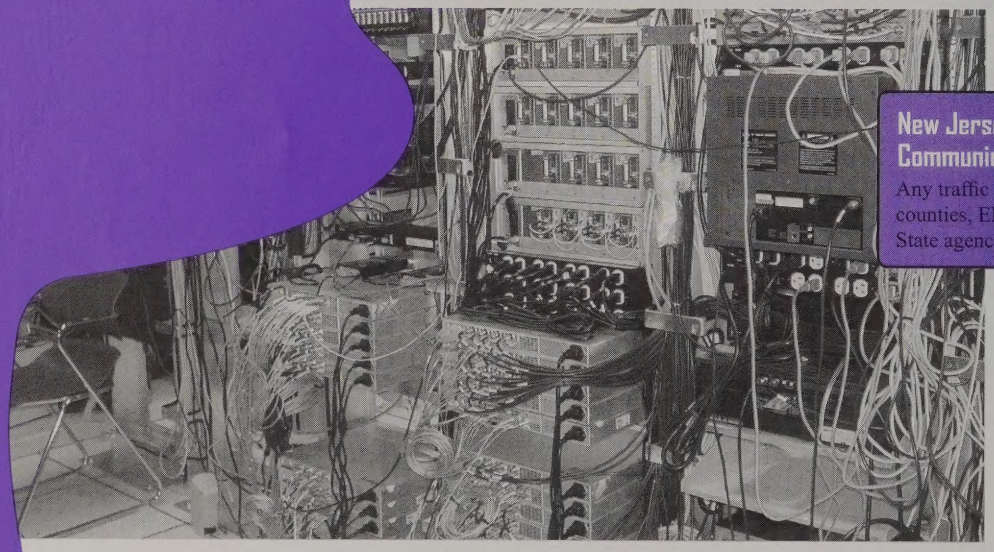

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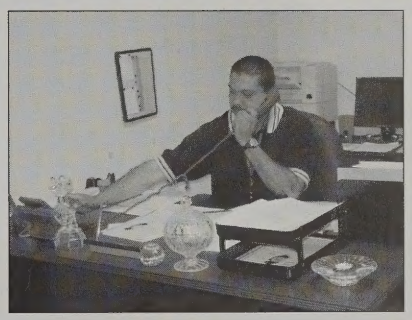

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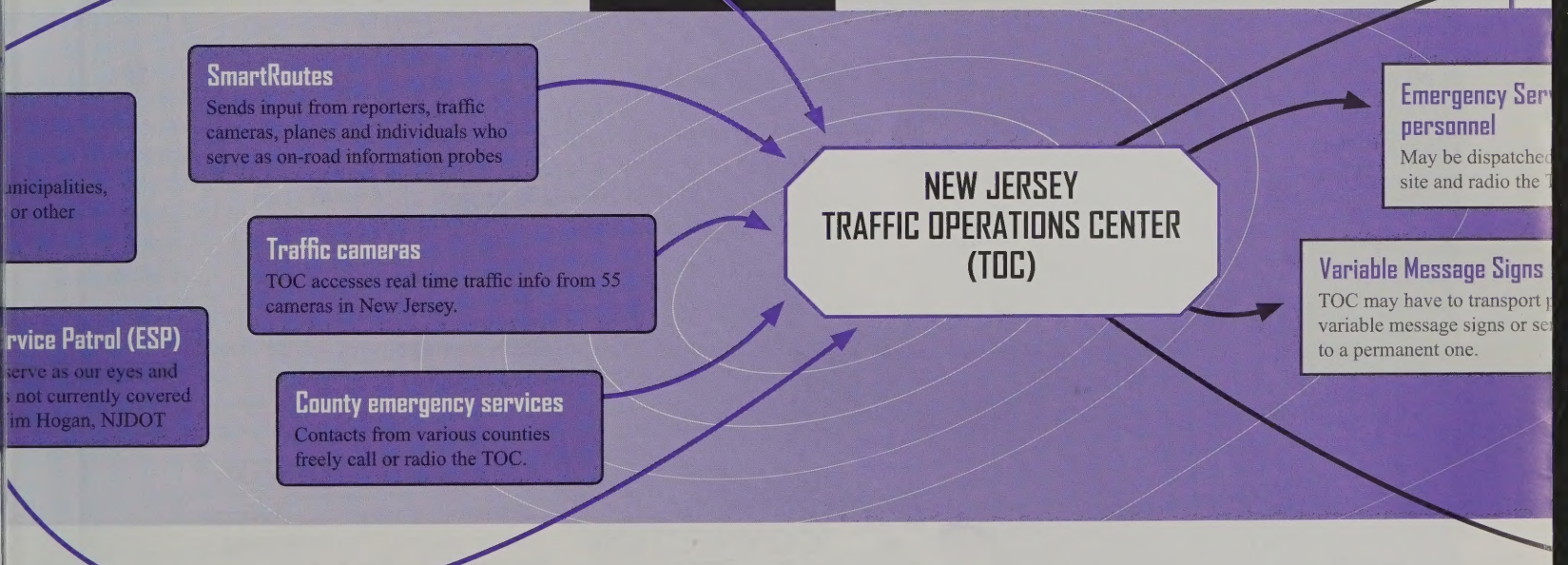

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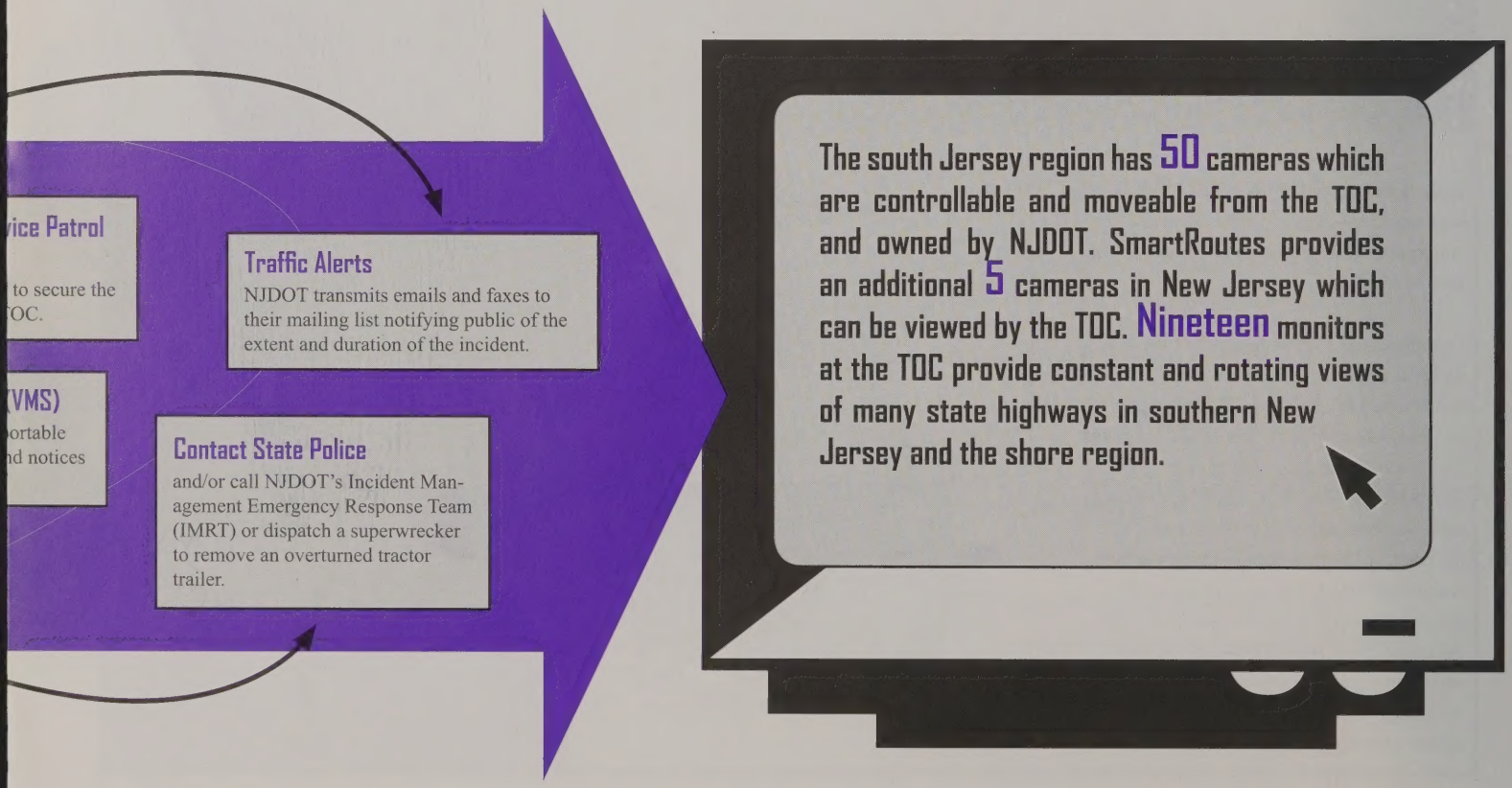


Main monitoring and control systems for camera operations in the TOC

providing images to the TOC. However, there are cameras on many of the region's State roads, and they are all transmitting live video images to the TOC as I watch.

It all adds up to a wall of constant video motion as the monitors display various and changing locations of visible traffic flow.. The majority of the cameras can be panned, tilted and/or zoomed, and TOC personnel make the determination of which cameras are displayed on each monitor. At the same time, TOC personnel can direct cameras to provide a better look at an area suffering from visible but unexplained congestion or back-ups. If the camera(s) return a view of an accident, vehicle breakdown or other disturbance, NJDOT TOC personnel can react as necessary. But here is where it gets

There are 22 fixed/permanent VMS signs that can be programmed from the TOC.

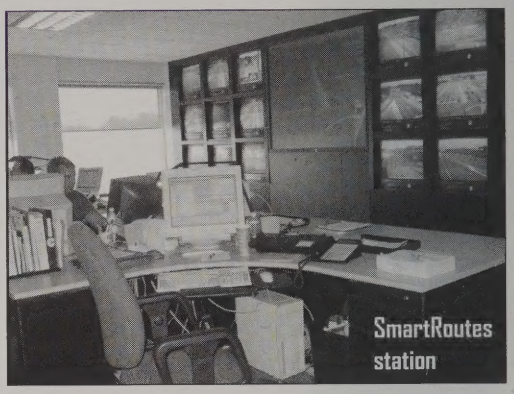
even more interesting, as NJDOT's well organized responses to traffic incidents and congestion result in an improvement of the flow of traffic.

I am there less than an hour when the activity level begins to increase as a result of camera images of Route 676 (in Camden) on one of the monitors. The traffic is backing up quickly and it is not yet clear as to why. Mike Sickles, TOC Shift Supervisor, calls out for a better view of the cause of the back-up. The camera covering that area is oriented for a better view of the scene, and then zoomed in for a closer look. Then the entire scene is transferred to the largest monitor in the center of the wall. While the images from the camera do not clearly define what the problem is, it does show a minivan in the slow lane as the cause of the slowdown. Mike asks NJDOT's John Tronco to radio dispatch a nearby Emergency Service Patrol (ESP) vehicle to the scene to assist the TOC in determining the problem and to help the situation, if possible. The TOC also calls the NJ State Police to the scene as a precaution.

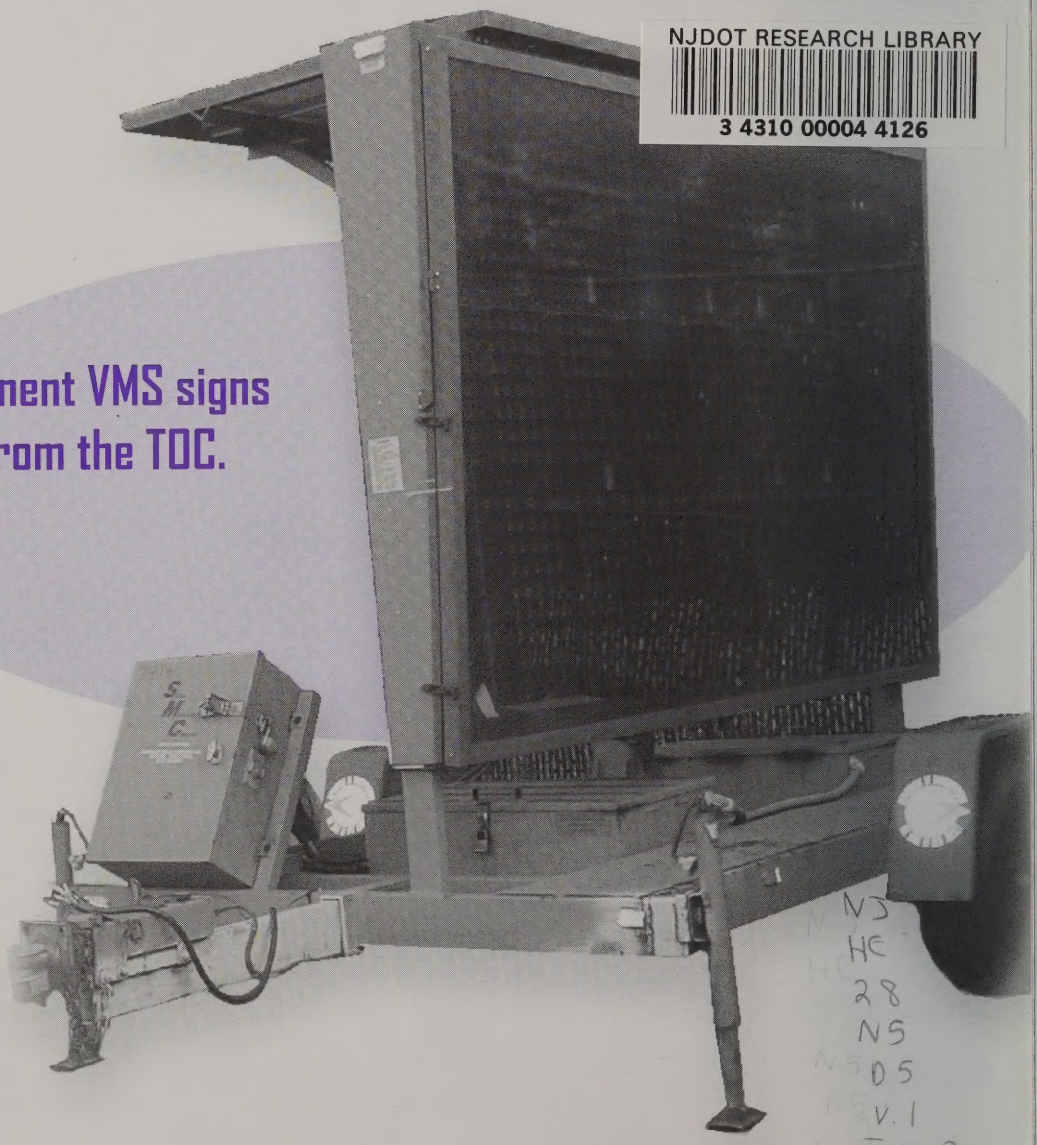
SmartRoutes provides a service that allows a caller to get real-time traffic information about a variety of highways in the region.

Minutes later, the ESP vehicle arrives at the scene and determines that the vehicle's engine stopped while it was in the right lane preparing to exit the highway. The ESP radios this information into the TOC and indicates that it will remove the vehicle to the road's shoulder. The State Police arrive in time to add an element of safety to the scene as the ESP vehicle gets into position to push the minivan onto the shoulder and out of the line of traffic. Within minutes, the minivan is safely out of the flow of traffic and secured on the shoulder as a private tow truck is summoned from the TOC. Minutes later, the back-up has dissipated and an orderly flow of traffic returns to the roadway.

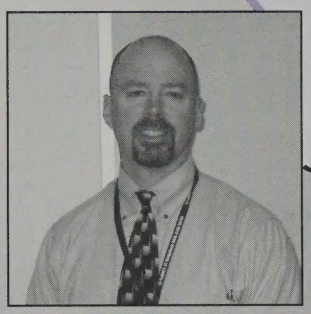
Suddenly the large monitor's image is replaced with the scene of another back-up on Route 73 and the TOC springs back into action! My blood pressure increases as the TOC becomes frantic in response to new activity…is *my* shift over yet???



SmartRoutes station



Southern New Jersey Traffic Operations Center COVERAGE AREA



Jim Hogan,
Director of Traffic Operations

Mark Smith,
TOC Supervisor

NJDOT's computerized traffic signal system is joined by fiber optic cabling and measures traffic flow while adjusting traffic signal timing.

Computerized Signal System

NJDOT has constructed a computerized traffic signal system, joined by fiber optic cabling, that automatically measures traffic flow and adjusts traffic signal timing to assist in a more efficient flow of traffic. This project, which will be completed by the beginning of 2005, includes large, heavily traveled portions of Routes 38, 70 and 73. However, a portion of the project along Route 73, from the Tacony-Palmyra Bridge to the Berlin Circle is currently in operation, resulting in a 15-25% decrease in daily travel time, with a 3-4% decrease in peak hour travel time. NJDOT acknowledges that, while the tremendous traffic flow along this roadway during peak hours overwhelms any system, the computerized traffic signals are assisting in a measurable way for 20 of the 24 hours in a day.

Like What You See?

Then let us know! If you'd like to receive future issues of the Discovery Series and our quarterly newsletter, please call Cross County Connection at (856)596-8228 to sign up. Or, you can email us at ccctma@transportationchoices.com.

This publication was produced by:

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CROSS COUNTY CONNECTION
TRANSPORTATION MANAGEMENT ASSOCIATION

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